DIVISION BY FACTORING

FACT 1: Division may be simplified greatly by factoring the dividend and the divisor.

$$\frac{105}{21} = \frac{3 \times 5 \times 7}{3 \times 7} = \frac{\cancel{3}}{\cancel{3}} \times \frac{5}{1} \times \frac{\cancel{7}}{\cancel{7}} = 1 \times 5 \times 1 = 5$$

Note that a number divided by itself is 1. Note also that a number multiplied by 1 is the same number.

FACT 2: We may simply cancel out the same factors that are above and below the line.

$$1092 \div 182 = \frac{1092}{182} = \frac{\cancel{2} \times 2 \times 3 \times \cancel{7} \times \cancel{13}}{\cancel{2} \times \cancel{7} \times \cancel{13}}$$
$$= 2 \times 3$$
$$= 6$$

FACT 3: Alternatively we may divide the numbers above and below the line by the same factor until we get the quotient.

$$1092 \div 182 = \frac{\cancel{1092}^{546}}{\cancel{182}_{91}} = \frac{\cancel{546}^{78}}{\cancel{91}_{13}} = \frac{\cancel{78}^{6}}{\cancel{13}_{1}} = 6$$

(Factor out 2) (Factor out 7) (Factor out 13)

$$16800 \div 5600 = \frac{16800}{5600} = \frac{\cancel{168}^{21}}{\cancel{56}_{7}} = \frac{\cancel{21}^{3}}{\cancel{7}_{1}} = 3$$

(Factor out 100) (Factor out 8) (Factor out 7)

1. Divide by canceling the common factors

(a) 36 ÷ 12
(b) 98 ÷ 14
(c) 125 ÷ 25
(d) 504 ÷ 36
(e) 980 ÷ 28
(f) 270 ÷ 18
(g) 189 ÷ 21
(h) 350 ÷ 14
(i) 272 ÷ 16
(j) 640 ÷ 40
(k) 783 ÷ 27
(l) 544 ÷ 32
(m) 806 ÷ 26
(n) 966 ÷ 42
(o) 3885 ÷ 105
(p) 7920 ÷ 240
(q) 60000 ÷ 2400
(r) 17640 ÷ 630

Answer: 1. (a) 3 (b) 7 (c) 5 (d) 14 (e) 35 (f) 15 (g) 9 (h) 25 (i) 17 (j) 16 (k) 29 (l) 17 (m) 31 (n) 23 (o) 37 (p) 33 (q) 25 (r) 28

End of Lesson